Diseases of Fur Animals

BY J. E. SHILLINGER [1]

HERE is a concise discussion of some of the principal diseases and parasites that affect silver foxes and minks as raised on fur farms, with suggestions for prevention and treatment.

THE BUSINESS of raising animals for their fur has passed rapidly through progressive stages to a degree of efficiency comparable with that of other branches of animal husbandry. With this development has come fairly efficient control of the diseases of these animals. Since silver foxes and minks are the species most frequently propagated on fur farms, research on the diseases of these animals has been given the most consideration. Some of the ailments of these groups are very similar to those of other animals under domestication, while others appear to be peculiar to the fox and mink.

Since construction of the pens and kennels necessary for keeping fur animals is expensive, most fur farmers concentrate many animals in small pens or on limited areas (fig. 1). This crowding permits easy and rapid transmission of infections from animal to animal (fig. 2). Feed of the kind supplied to fur animals—composed largely of a mixture of meats, fish, and cereals—attracts rats, birds, and flies, which add to the danger of spreading infections through their movement from pen to pen.

Cross references are given in this article to other articles in the Yearbook.

INFECTIOUS DISEASES

PARATYPHOID

While organisms belonging to the paratyphoid group are infectious to a variety of animals and to man, many of them appear to be rather specific to certain hosts. Epizootics, or severe outbreaks, of para-

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typhoid are rather frequent among silver foxes raised on fur farms. Affected animals are ordinarily sick for 2 or 3 weeks. The first evidence of the infection is a decline in appetite, followed by a gradual

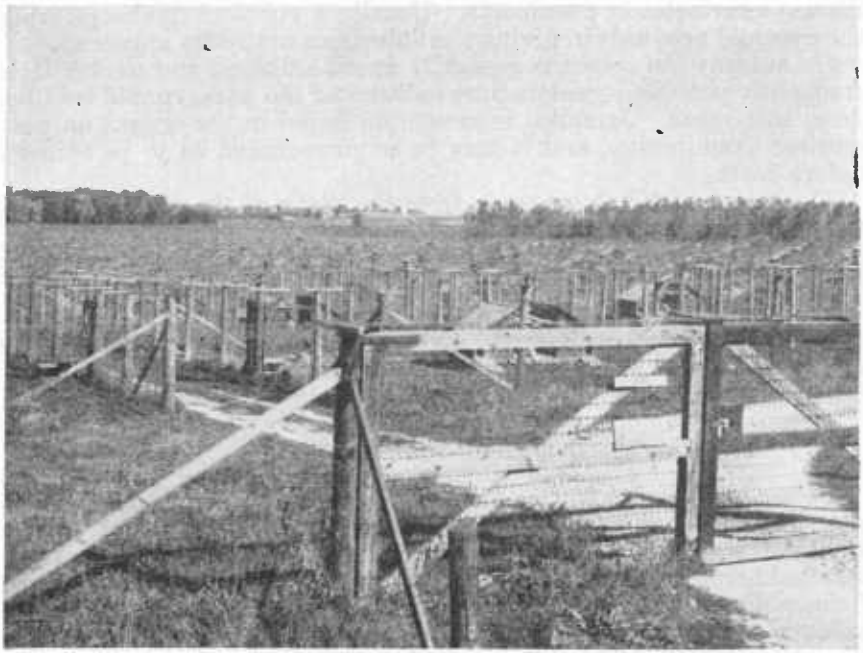

FIGURE 1.—Arrangement of pens on a typical fur farm. Such crowding of the animals permits ready spread of disease germs. (Courtesy of Herbert A. Nieman and Co., Thiensville, Wis.)

FIGURE 2.—A pair of silver foxes on a fur range, showing the possibility for disease spread if one animal is infected. (Courtesy of Herbert A. Nieman and Co., Thiensville, Wis.)

loss of flesh and of the luster of the fur. There is usually diarrhea, and the passages may be streaked with blood.

When paratyphoid is chronic, entailing continuous lack of appetite, emaciation is extreme, and the eyes are sunken. In some cases the disease terminates in pneumonia. Usually a purulent discharge from the eyes and nose aids in giving the animal an unthrifty appearance.

On autopsy the spleen is generally found enlarged and dark. It is frequently possible to isolate pure cultures of the paratyphoid bacillus from this organ. Jaundice is sometimes found in the organs on post mortem examination, and it may be so pronounced as to be evident before death.

Treatment with vaccine made from the strain of the organism present on the fur farm is recommended; properly made and administered, it may be very effective in checking outbreaks. Commercial vaccines containing several of the more common strains of paratyphoid organisms also have been used on a number of fur farms with excellent results. While the use of stock vaccines for this disease among foxes is not recommended when vaccine can be made from the particular strain causing an outbreak, they may be resorted to in emergencies.

Infectious Enteritis

Bacteria belonging to the *Salmonella* group, which produce extensive intestinal injury, frequently become established on fur farms. Contaminated feed or water and the bringing in of animals from infected herds are the usual channels by which the disease is introduced. *Salmonella* organisms thrive in the intestinal tract, where they cause extensive inflammation of the mucous membrane. As this inflammation progresses, considerable destruction of tissue occurs, entailing constant oozing of blood. Autopsies of animals dying from this disease usually reveal sloughing of the mucous membrane throughout the small intestine.

No biological product, such as vaccine, bacterin, or serum, seems to be of much value in checking outbreaks of enteritis on fur farms, and poor results have followed the use of astringents, such as tannic acid, alum, and limewater. Astringents may temporarily relieve symptoms, but they are ineffective against the organisms themselves. A number of ranchers have reported very beneficial results from the use of buttermilk, preferably that made by the action of *Lactobacillus acidophilus*. The fermented milk may be given alone if the animals can be induced to take it, or it may be combined with the regular ration. In combating enteritis on fur farms, it is highly important to prevent the spread of infectious material from pen to pen. Disinfection of utensils and equipment with coal-tar or chlorine products is recommended. (See Disinfection and Disinfectants, p. 179.)

Distemper

The term "distemper" was formerly loosely applied to various epizootic diseases of animals—that is, diseases occurring in severe outbreaks—but the condition recognized as canine distemper (see p. 1124) is now known to be a definite ailment due to a specific filtrable virus, to

which foxes and minks as well as dogs are susceptible. It also appears that certain other viruses that are closely related and cause somewhat similar symptoms are common infections on fur farms.

Distemper is a highly contagious disease of dogs, ferrets, foxes, and minks. While it may also attack other animals, it is best known in the species named, in which the most complete studies of the disease have been made.

Silver foxes usually show symptoms of distemper—listlessness, loss of appetite, and fever—within a few days after exposure. A bloody diarrhea is often evident, and the fur has an unkept appearance. Closer examination shows a dry muzzle, although there may sometimes be a watery discharge from the nose. The conjunctiva (mucous membrane covering the eyeball and the inner side of the eyelid) is almost invariably much reddened. Only during the early stages of the disease is a sick animal likely to infect others. The virus is readily transmitted from pen to pen by attendants, and hence it is not unusual for the infection to appear almost simultaneously in various parts of the ranch.

Autopsy of distempered animals may fail to disclose any pronounced changes in the organs. The spleen and liver are often slightly enlarged and somewhat darker than usual. The muscles may appear paler than normal, with occasional small hemorrhagic spots. An absence of food materials in the digestive tract because of the lack of appetite preceding death is often noted, although it is not unusual to find an excess of mucus tinged with blood and an inflamed mucous membrane lining the stomach and intestine.

In minks a discharge from the eyes as well as from the nose frequently becomes purulent and tends to seal the eyelids and clog the nostrils. The feet of minks are frequently swollen, especially on the under side, which makes the pads appear unusually large.

In the control of distemper on a fur farm it is essential that the caretaker exercise extreme precautions to prevent spread of the virus from infected to healthy animals. Since so many agents can carry the infection, it is recommended that affected animals be isolated so that birds, rodents, and flies will not have access to them, or at least are not likely to visit them and then go among the healthy stock. Likewise the attendant should take care not to carry the infection on his clothing or on equipment and feeding utensils. The practice of liberating large numbers of silver foxes on furring ranges or in furring sheds where they may come in intimate contact with each other affords an ideal opportunity for the spread of the disease. Considerable evidence is now available indicating that distemper, as well as other infections, is probably spread through nasal secretions.

Medicinal treatments are of little if any value as curative measures. The use of anti-canine-distemper serum,[2] if it is administered in adequate quantities before symptoms appear, provides effective protection for a temporary period. Experiments are in progress to develop a vaccine that will produce a more lasting immunity.

[2] OTT, GEORGE L. TREATMENT OF FOX DISTEMPER. Amer. Vet. Med. Assoc. Jour. '94: 522–524. 525. illus. 1939.
SHILLINGER, J. E. DISEASES OF FUR ANIMALS. U. S. Dept. Agr. Farmers' Bul. 1777, 22 pp., illus. 1937.

Anthrax

On various occasions during recent years, anthrax, a disease well known in domestic stock (see p. 250), has been diagnosed on mink farms.[3] In all these instances the infection was directly traceable to feeding minks parts of the carcass of an animal that proved to have had this disease. Since it is the common practice to grind the meat portion of the ration fine and mix it with cereals and other food products, most of the animals on a mink farm have usually been given the anthrax-infected meat and consequently are infected before the condition is recognized. Because of the great loss anthrax entails and because of the danger to human beings, it is highly important that every precaution be taken to prevent the use of diseased beef or other meat in feeding fur animals.

INTERNAL PARASITES

In the earlier stages of fur-animal husbandry severe losses often resulted from gross infestation of the animals by internal parasites. (See p. 124.) Hookworms of the species *Uncinaria stenocephala* may become very numerous in animals kept in pens on the ground, without floors. These worms, attached to the mucous lining of the intestinal tract, make wounds from which they extract blood. Heavy hookworm infestation results in pronounced anemia and may be recognized by unthriftiness of the animals and by their pasty, grayish droppings.

The use of tetrachlorethylene in doses of about 0.1 cubic centimeter per pound of body weight has proved effective in expelling these parasites. The treated animals should be removed to uncontaminated enclosures or placed in clean pens with wire-mesh floors.

Ascarids, or roundworms, of the species *Toxacara canis* are frequently parasitic in silver foxes, especially among the young animals. These worms, when mature, may measure 4 inches in length, and if they are numerous they may cause extensive injury and even death. So generally present are they on fur farms that it is the regular practice to treat all fox pups raised in ground-floored pens at about 3 to 5 weeks of age with a suitable anthelmintic. Oil of chenopodium, in doses of 0.025 to 0.05 cubic centimeter per pound of body weight, is satisfactory. Because of the irritating effects of this medicine in the digestive tract some fur farmers prefer tetrachlorethylene in the same dose recommended for hookworms, even though it is somewhat less efficient.

Feed and the animals' fur become contaminated with ascarid eggs passed out in the droppings, and the infestation is acquired in the feed or when the animals lick their fur. Many fur farmers are now raising their silver foxes in pens with elevated wire-mesh floors, and this sanitary precaution usually prevents any harmful degree of parasitism.

Lungworms also are a serious menace on some farms where foxes are maintained on the ground. Two species, *Eucoleus aerophila* and

[3] Pinkerton, Henry. An outbreak of anthrax infection in minks with infection of ranch owner. Amer. Med. Assoc. Jour. 112: 1148–1149. 1939.

Crenosoma decoratum, are parasitic in these animals. They lodge in the minute air passages of the lungs and in the lung tissue and cause a profuse secretion of mucus that hinders breathing. Frequent coughing and wheezing are symptoms of lungworm infestation. The excessive mucus and the tissue damage caused by the worms are likely to induce verminous pneumonia. These parasites produce great numbers of eggs that are highly resistant to chemical disinfection or to the action of the weather.

No form of medication appears to be practicable for the removal of lungworms, but the use of pens with wire-mesh floors that permit the contaminating material to fall through and out of reach of the animals will prevent serious infestations.

EXTERNAL PARASITES

Though external parasites alone may not be responsible for extensive losses on fur farms, infestation by fleas and mange mites (see p. 1188 and p. 1174) may render the pelts unsightly and of low value. Fleas become numerous on some fur farms. Control is effected most successfully by repeated use of dry powders rather than by the more severe treatment with fluid dips and oily ointments. Pyrethrum powder, flowers of sulfur, or derris powder may be used. The last, if of good quality, is preferable.

Body mange seldom affects fur animals. When it does become established, it is often advisable to destroy a few affected animals rather than to attempt to treat them and run the risk of the infestation spreading. Ear mange, however, is a common disease of silver foxes. It results from infestation by the mite *Otodectes cynotes*, which causes sufficient irritation of the skin on the inner surface of the ear to produce scabs and an increase of waxy secretion. These accumulate as large crusts. The affected animals are inclined to hold the head to one side, turn in circles, shake the head, and attempt to scratch the part involved. Because of the ease with which this parasite is spread, a large proportion of the animals on a ranch are usually affected before the trouble is recognized. It is advisable, therefore, to treat all the animals on a ranch when attempting to get rid of the infestation.

After removal of the incrustations with blunt forceps, treatment with one of the following remedies is recommended:

(1) Iodoform, 1 part; ether, 10 parts; cottonseed oil, 25 parts.

(2) Oil of cade, 1 part; cottonseed oil, 8 parts.

(3) Carbolic acid crystals (phenol), 2 parts; cottonseed oil or liquid petrolatum, 98 parts.

These substances can be applied with a brush or a cotton swab. It may be necessary to repeat the treatment in 10 to 14 days to insure killing all the mites.

NUTRITIONAL DISEASES

Some years ago the well-known disease, rickets, was rather common on fur farms. More complete knowledge of the nutritional require-

ments of fur animals, however, has since made this condition a rarity. A sufficient quantity of vitamin D in the ration is effective in preventing rickets. This is usually supplied in the form of feeds high in this element, such as eggs and cod-liver oil.

When attendants are careless about the care and storage of feed, botulism or other types of food poisoning sometimes occur, especially in minks. Poor refrigeration of stored meats permits spoilage, and the unused portions of such feed allowed to remain in the pens undergo decomposition rapidly. Such material may cause severe losses from various types of food poisoning, of which botulism is the most common. Adequate refrigeration of feed and the removal of uneaten remains will prevent losses from this cause.

A form of nutritional irregularity that has been observed among silver foxes to which liberal quantities of fresh fish have been fed has been described under the name "Chastek paralysis."[4] This condition results from a deficiency of vitamin B_1 in the ration. Recent work has indicated that there is a factor in certain fish that is destructive to vitamin B_1,[5] but that this factor can be eliminated by adequate cooking of the fish.

In this malady the animals suffer a spastic paralysis, which usually terminates in death. Sick animals respond rapidly to the administration of vitamin B_1, however, and an outbreak ceases rather promptly when fresh fish is excluded from the ration or when the fish is well cooked before it is fed.

[4] GREEN, R. G. CHASTEK PARALYSIS IN NURSING FOX PUPS. Natl. Fur News 10 (9): 11, 24. 1941.

[5] COOMBES, A. IRVING. FEEDING FISH TO FUR BEARING ANIMALS. Amer. Natl. Fur and Market Jour. 19 (3): 5–6, 24–25, illus. 1940.